



Oakley Greenwood

Efficiency and the energy revolution

Energy systems are changing around the world with innovations in renewables, energy storage and networks. What does this mean for energy efficiency, and how should the sector adapt to thrive?

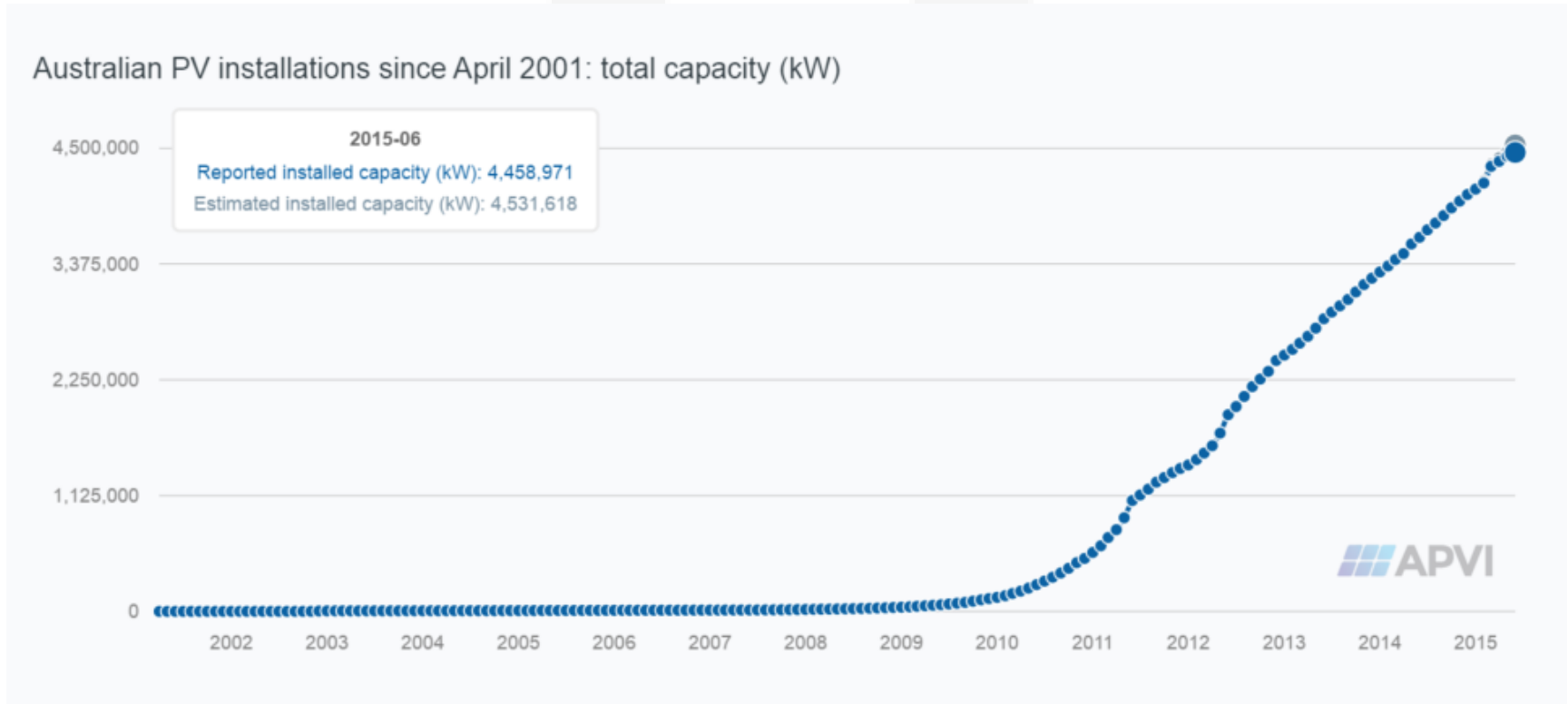
*Energy Efficiency Council Annual Conference?
November 2015
Melbourne*

Significant issues that will make a difference

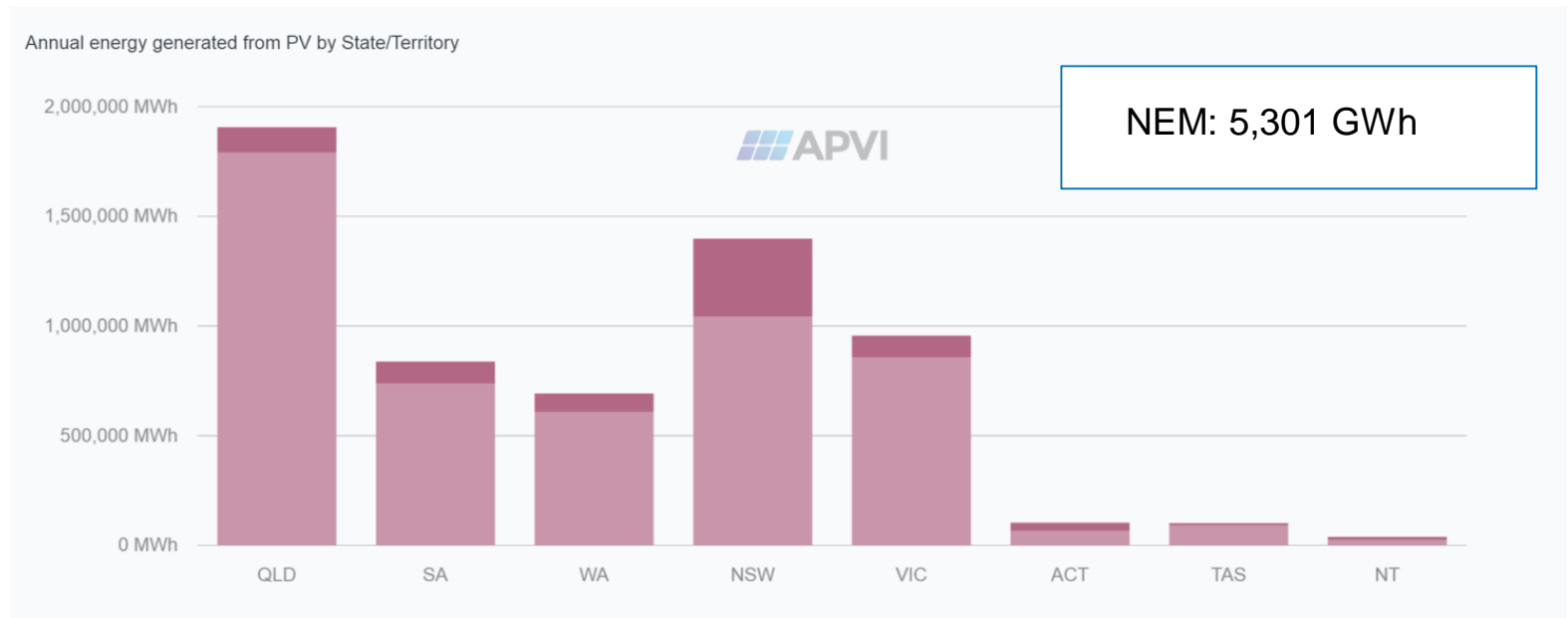
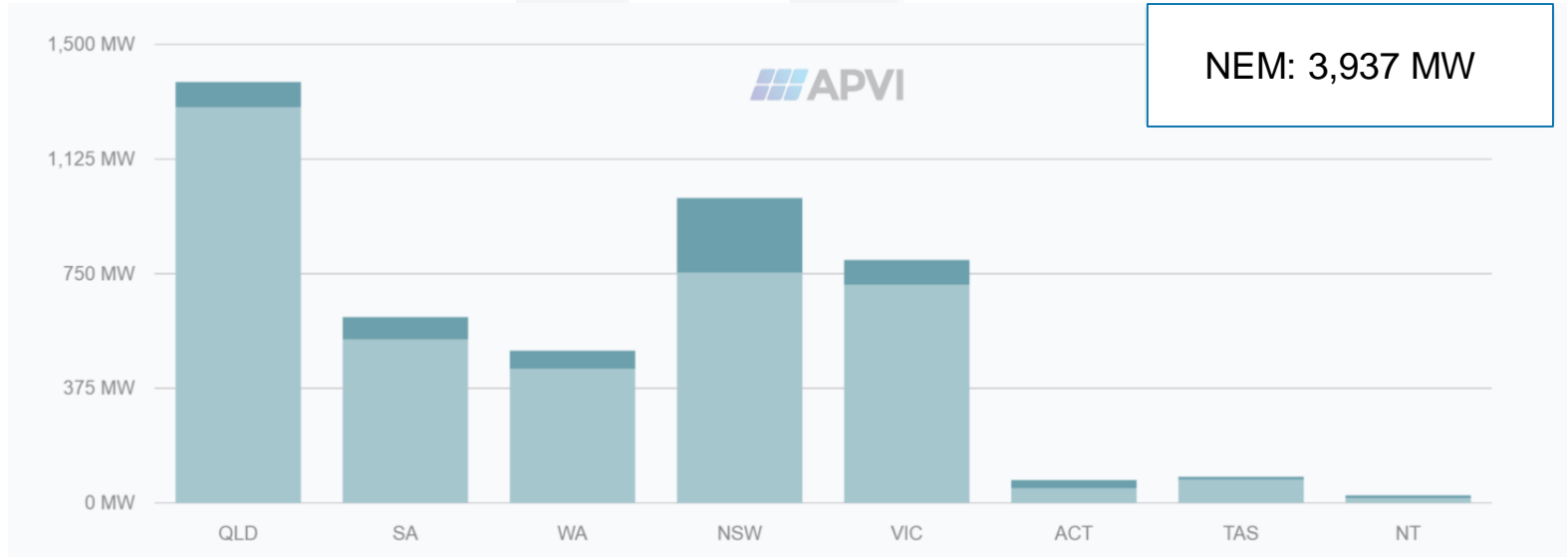
- Declining PV and battery costs (including associated incentive payments)
- Emerging PV business models
- Continued softness in wholesale electricity prices
- Changes to network tariffs that are likely to put downward pressure on variable electricity prices
- Continued and probably increased policy emphasis on reducing carbon emissions
- Improved state-level energy efficiency programs (NSW and VIC at least)

The challenge: Most of these developments will draw attention to PV and battery storage - potentially at the expense of energy efficiency

Cumulative PV installed capacity (kW) Apr 2001 - Jun 2015

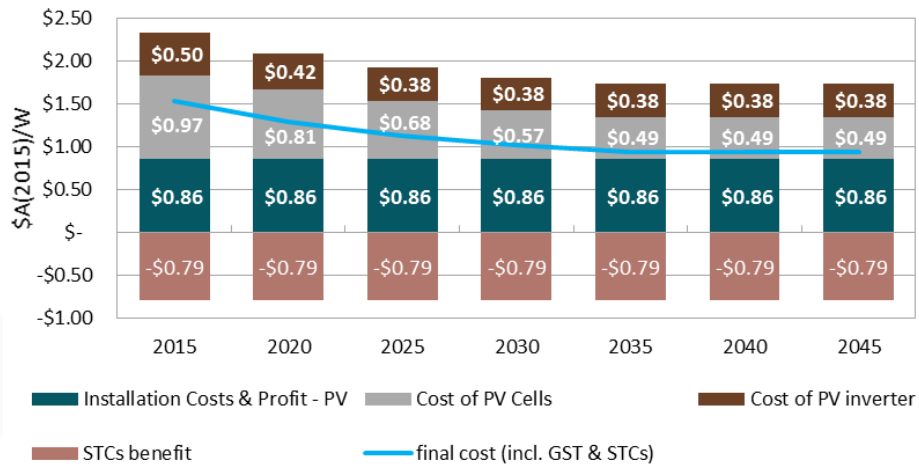


Installed PV capacity and generation by state - June 2015

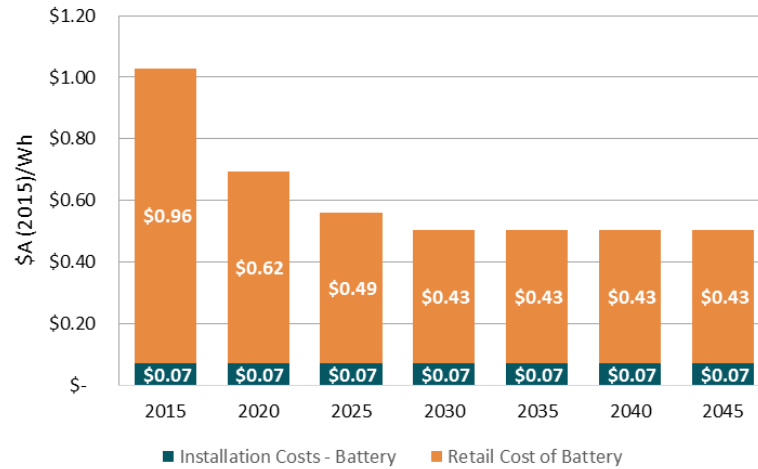


PV and battery price forecast

Solar PV Experience Curve

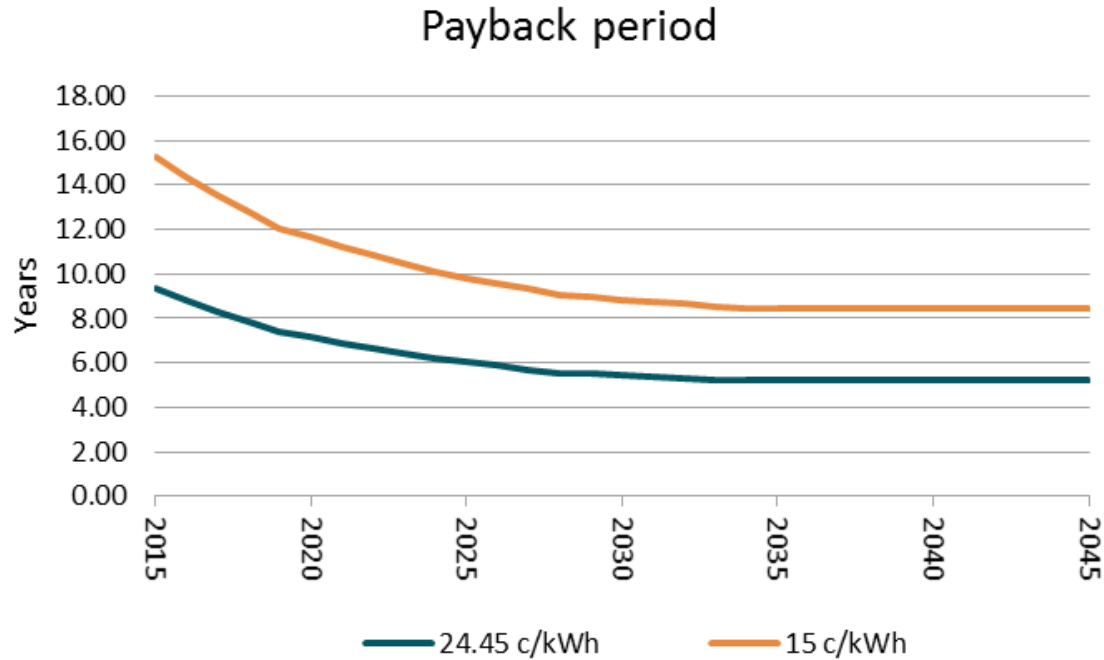


Li-Ion Battery Storage Experience Curve



Sources: BNEF, APVI, OGW analysis

PV and battery simple payback



Based on a simple payback calculation of a grid connected 7kWh battery + 5kW solar with an annual household consumption of 6500kWh. Assumes all household energy displaced and no FiT for excess solar PV.

Tariff = 24.45c/kWh (AGL market price, Brisbane)

Emerging business models

- Retailers and third-party technology providers have developed new business models
 - The provider supplies (and generally continues to own) the equipment - which will increasingly include battery storage
 - The provider supplies electricity to the end user at a fixed price for a fixed term under a power purchases agreement (PPA)
 - The provider gets the STCs, RECs etc., and any revenue from exported electricity
 - Electricity retailers can add a contract for any-grid-based power needed and (from December 2017) advanced metering
 - PV+battery can be taken up with little or no out-of-pocket expense - it's green and visible
- Will this supplant interest in EE?
 - Note that at present the providers of these systems don't provide EE
 - EE reduces the size of the PV system needed (reduces topline revenue)
 - Is there a role for EE providers to take on PV+battery such that the total cost-effectiveness for the end-user increases?

Policy developments

- PV+battery and the grid
 - Lots of attention - AEMC, ENA and CSIRO, ARENA, state governments (both policy and incentives)
 - Will there be an effective means for integrating DG and the grid?
- The 27% Paris commitment
 - Even at saturation levels rooftop PV won't get us there
 - An extended LRET gets very close
 - EE with either could help
- The prospects for the state-level energy efficiency programs
 - VEET extended and enlarged
 - NSW ESS extended and enlarged
 - The ERF

VEET and ESS

Year	Target (Mt CO ₂ e)
2015	5.5
2016	5.4
2017	5.9
2018	6.1
2019	6.3
2020	6.5

Year	Target % of retailer sales
2016	7.0
2017	7.5
2018	8.0
2019 to 2025	8.5

VEET

- 33 eligible measures
 - 24 applicable to residential and commercial premises
 - 03 applicable to residential premises only
 - 06 applicable to commercial premises only
- Increased emphasis on commercial premises and gas

ESS

- Extends termination date to 2025, with a review in 2020
- Expands the program to gas by:
 - increasing the energy savings target on electricity sales (see below for target settings)
 - making gas savings eligible to create energy savings certificates
- Upward pressure on energy bills due to the increase in targets will be addressed by using the Climate Change Fund

EE in the ERF

Project type	Round 1 (Apr 2015)	Round 2 (Nov 2015)	Total to Date	
	Mtonnes	Mtonnes	Mtonnes	% of total
Sequestration	28.00		28.00	30.4%
Vegetation		25.60	25.60	27.8%
Landfill and waste	18.00	3.70	21.70	23.5%
Savannah burning	0.50	6.60	7.10	7.7%
Agriculture		4.00	4.00	4.3%
Energy efficiency		3.70	3.70	4.0%
Transport	0.15	1.10	1.25	1.4%
Industrial fugitives		0.80	0.80	0.9%
Piggeries	0.30		0.30	0.3%
Total	46.65	45.50	92.15	100.0%

Source: Commonwealth of Australia (Clean Energy Regulator) 2015

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